Available online at www.sciencedirect.com

ScienceDirect

Procedia - Social and Behavioral Sciences 182 (2015) 213 – 224

Procedia
Social and Behavioral Sciences

4th WORLD CONFERENCE ON EDUCATIONAL TECHNOLOGY RESEARCHES, WCETR-2014

Exploring the Use and the Impacts of Social Media on Teaching and Learning Science in Saudi

Saleh Abdullah Alabdulkareem [a]*

[a]*Associate Professor of Science Education,Curriculum and Instruction Department, College of Education, King Saud University, Riyadh, Saudi Arabia*

Mailing address: P.O. Box 8984 Riyadh 11652, Saudi Arabai

Research funded by: Educational Research Center, College of Education, King Saud University, Riyadh, Saudi Arabia

Abstract

This article reports on a study conducted on Saudi middle school science teachers and students. The study implemented a 46-item Likert-scale questionnaire, aimed to investigate teachers' vs. students' positions and views in regards: smart devices use and access, the current use of social websites, the use of the web, views of the impact of social media on education, and views of possible impact of official use of social media on teaching and learning. From the basic characteristics of Saudi middle school teachers and students, it is apparently that smart phones are the best possible device to enhance the use of social media in education, where all teachers and almost 75% of students own it, and almost 85% of the students have Internet access at home vs. 95% of the teachers. In regards the social media applications, teachers and students use WhatsApp as a main tool, with 100% for the teachers, and almost 73% for the students. Both the teachers and the students are willing to use social media in education, and they believe it will enhance their educational experiences, but the practice is significantly low; in the meantime, there are agreements that the use of social media is for socialisation only. The infrastructure is available, but the comprehension educational view is absent, the researcher suggest that there is a need for training to evaluate own use of social media, and to enhance the abilities to use available properties.

Peer-review under responsibility of Academic World Research and Education Center.

Keywords: Social media, informal learning, formal education, and science teaching.

1. Introduction

Interaction and Information technologies have reshaped our live today, and nowadays' Saudi students and teachers have a massive use of smart phones, iPads and other portable devices; moreover, they are continually

* Saleh Abdullah Alabdulkareem Tel.: +966-1-467-4635
E-mail address: dawerd@ksu.edu.sa

Peer-review under responsibility of Academic World Research and Education Center.
doi:10.1016/j.sbspro.2015.04.758

looking for cutting edge technologies. But often the use of these devices is not in ways anticipated by technology proponents. All these smart phones and other portable devices are equipped or ready for social media applications like Facebook, Twitter, Wikipedia ,YouTube, WhatsApp, Telegram, and Instagram, which are part of what is known as Social Web 2.0, best characterized by the notions of social interaction, content sharing, and collective intelligence. "Social connections affect so many aspects of our lives that our argument that they can also be applied to education and learning should be no surprise" (King and Sen, 2013, p.622). The role of emerging social media may offer new opportunities to enhance the teaching and learning experiences. Zepke and Leach (2010) conclude that motivation and student dispositions will influence their ability to engage in interactive learning. "Students, often referred to as digital natives (Prensky, 2001), have spent most of their time on computers, game consoles, digital music players, video cameras, cell phones, as well as the Web itself" (Jovanovic, Chiong, and Weise, 2012, p39)`

This paper aims to investigate the use of social media in teaching and learning science as a scaffolding tool, and the impact of that on teachers and students in Saudi. The paper argues that students can learn from informal learning situations, using what is available in students' hands, to build a meaningful learning experience in formal education.

2. Background

The truthful learning requires daily social interactions between students and teachers from one side, and from the other side between students and the daily life events; "bridging the all-too-well-known gap between the classroom and the real world. The learning has meaning and relates to the real world because it is modeled on the systems of the real world" (Klopfer, et al, 2009, p.9). Schools aim to develop and to support methods to improve the effectiveness and efficiency of interaction and collaboration among students, and with their teachers. Most of web social media tools have been developed in order to maintain, manage, and improve social interactions between people where people can easily access, reuse or comment on content that is authored by others. The evolving learning environments are allowing students to learn anytime and anywhere (Wetzel, 2010). Educational research demonstrates convincingly that immediate and frequent feedback improves learning (Hodder et al. 1989; Dihoff, Brosvic and Epstein 2003, 2004; Dubner and Levitt 2006; Hattie and Timperley 2007; King and Sen 2013). "Social networks may play an important role in raising awareness about the reliable resources of information among the students and society by providing alternative sources of knowledge". (Battrawi and Muhtaseb, 2013, p.1).

A report published in the US by the National School Board Association (2007) found that 96 percent of youth in this age range have used social networking tools at some time, with their average engagement with them rivaling time spent watching TV at 9 hours a week. Yet perhaps the most stunning statistic of their study is that the topic of most conversation at these sites is education—60 percent of the students' surveys said they use the sites to talk about education topics and more than 50 percent use it to talk about specific schoolwork. (Klopfer, et al, 2009, p.10)

Another report from the Pew Research Center (2010) revealed that 73% of teenagers use some form of social networking by incorporating social media into the lives of students in the classrooms, instructors also incorporate the new literacy that has become part of the students' out-of-school lives (Hahn, 2008; Casey & Evans, 2011). Mason (2008) describes some positive qualities of social media use in the classroom. For example, he points out that using social media in the classroom allows the teacher not only to incorporate multimedia and multimodal texts but also to share these quickly and easily, providing a collaborative learning environment where students can communicate at any time.

Great deal of research in education provides evidence for the effectiveness of using social media technologies directly in the context of traditional education situations or online education (Barab and Duffy 2000; Graff 2003; Rovai 2003; Shea 2006; Dawson 2006; DeSchryver et al. 2009). Some studies have demonstrated the benefits of online social interaction in the learning process. Positive aspects of online interaction with teachers and peers include the following: access to peer and expert knowledge, ability to receive feedback from teachers and peers, and an opportunity to reflect on the exchanged messages (Ellis, 2001). By expressing their thoughts, discussing and challenging the ideas of others, and working together towards a group solution to a given problem, students develop critical thinking skills as well as skills of self-reflection and co-construction of knowledge and meaning (Brindley, Walti, & Blaschke, 2009).

Junco, Heilberger and Loken (2010) sought to discover a causal link between the use of Twitter and other social media and student engagement. Twitter has been studied in relation to its effect on student interaction and engagement, "students engaged with faculty and each other in a vibrant and connected virtual learning environment" (Junco et al, 2010, p. 8). Twitter was also used as a contact path between students and faculty, the use of Twitter

encouraged students to cooperate, “students feel more comfortable asking questions they may not be comfortable with asking in class” (Junco et al., 2010, p. 9). Greenhow and Gleason (2012) explore the use of Twitter as a new literacy practice. They suggest that when used, it may lead to increased engagement and better interaction between students and teachers. This view is also shared by Fusch (2011), who argues that the tools of the trade are as important as the learning objectives, and that tools are needed which promote social presence, create a more interactive learning environment and foster collaborative study. (In: Dunn, 2013)

However, researchers and practitioners alike have found that interactions cannot be easily established in a learning environment. This often comes as a result of an inappropriate course design (Brindley et al., 2009) and/or the students’ lack of collaboration skills, such as decision-making, consensus building, and dealing with conflict (Finegold & Cooke, 2006). Therefore, in order to yield the expected educational benefits, the technology in general and social networking tools in particular have to be accompanied with a sound pedagogical approach. (Jovanovic et al, 2012, p. 40).

The UNICCO Media and Information Literacy Curriculum for Teachers (MIL) suggest that enhancing the appropriate use of media information among students requires that teachers themselves become media and information literate; this will enhance capacities to empower students with their efforts in learning to learn, learning autonomously, and pursuing lifelong learning. By educating students to become media and information literate, teachers would be responding first to their role as advocates of an informed and rational citizenry, and second, they would be responding to changes in their role as educators, as teaching moves away from being teacher-centred to becoming more learner-centred. (Wilson, et al, 2011, p. 17). Furthermore, the UNICCO MIL model argues that teachers are more likely to embrace the use of information and media tools if it connects with pedagogical strategies that improve how they teach traditional school subjects.

Some of the negative aspects of using social media technologies seen as that these technologies for learning minimize the active participation of the learner; in fact, such technologies are developed so that they can work for any learner, regardless of the motivation or the ability of the particular learner. Technologies for learning are essentially teaching technologies structured to reliably deliver and measure outcomes regardless of the context or the situation of the learner. (Halverson and Smith, 2009, p 51).

Teachers would need to become interdisciplinary facilitators of student creativity, readily able to guide learning toward intended outcomes while creating legitimate space for experimentation. Social media would allow students to create and test knowledge claims. Social media would extend communication networks, provide immediate access to information, and facilitate new forms of creative expression. (Halverson and Smith, 2009).

Accordingly, social networks could be employed in science education as virtual informal science learning settings. The characteristics of such technologies make them extraordinary media for raising interest and culture in science as they have been used for various educational purposes including peer-learning, teacher-student discussions, and scientist-public interactions. (Battrawi and Muhtaseb, 2013, p.2).

In Saudi there are a very limited research on the use of social media technologies in public schools because of the current regulations of bringing cell phones, smart phones, iPads and other communication devices, where in case of bringing these devices to school, there will be a punishment for the student by conducting grades from behaviour and discipline due to the Ministry of Education (MOE) concerns in regards the safety and privacy of students. Although the MOE plans in developing learning and teaching are putting real concerns of using these tools in education.

This paper will discuss the questions of whether and how social media technologies have influenced teaching and learning science in Saudi, and what paths are open (and closed) for future impact.

2.1. Social Media

Social media can be defined as "a group of Internet-based applications ‘interactive platforms’ that build on the ideological and technological foundations of Web 2.0 that allow the creation and exchanges of user-generated content." (Kaplan and Haenlein, 2008, in: Ralph and Ralph, 2013, p. 451).

Daily news showing that the number of social network users is growing significantly worldwide; besides that, social networks capabilities are increasingly being leveraged effectively. Moreover, social networks are becoming less complex and more accessible; where young and older people can create and share content and interact easily through social networks.

Social media can include text, audio, video, images, podcasts, and other multimedia communications. In today's social space social media is undoubtedly one of the most powerful origins of information and news, and constant updates aided by platforms like Twitter, Facebook, and Wikis. (Ralph and Ralph, 2013. P.451). Social media then, includes the various online technology tools that enable people to communicate easily via the internet and to share information and resources.

2.2. Web 2.0 Technologies

Web 2.0 technologies are web services which center around user-provided content, like flickr, YouTube, or Facebook. (Klopfer, et al, 2009, p.13)

2.3. Social Interactions

Social media play major role in developing social interactions between students and the society in general, that is mean widening the limits of teaching from class walls to be within the community. King and Sen (2013) highlighted three science learning principles related to social connections in teaching:

Principle 1: Social Connections Motivate, that is mean getting students to take actions that involve social interaction or that benefit the community -such as recycling- is often far easier.

Principle 2: Teaching Teaches the Teacher, where in traditional teaching situation the difficulty of mind wandering instead of being engaged socially, cannot help students learn, to say nothing about teaching evaluations.

Principle 3: Instant Feedback Improves Learning, where immediate and frequent feedback improves learning and teaching as well.

2.4. Informal Science Education

Informal science education refers to the activities that occur outside the school setting, which are not developed primarily for school use, not developed to be part of an ongoing school curriculum, and characterized as voluntary as opposed to mandatory participation (Crane, et al, 1994), it is also include related activities in media (TV, radio, and film), science centers and museums, zoos and aquariums, botanical gardens and nature centers, cyber learning and gaming, and youth, community, and out of school time programs. (CAISE website, 2014). Informal science education is becoming increasingly popular worldwide, as it allows for a better understanding of scientific and natural phenomena as well as a better retention as it engages the learner in a personal experience. (Battrawi and Muhtaseb, 2013, p.2)

2.5. Safety of Social Media Tools

Culturally popular sites like MySpace, Facebook, and Bebo however, have received intense backlash from schools which are fearful for the online safety of students using these sites, as well as the concern that students will misuse them during what is supposed to be instructional time. As a result, numerous alternative sites have emerged to provide teachers with more suitable platforms to host classroom online communities; also teachers can create their own private social network housed within trusted sites. (Klopfer, et al, 2009, p.10)

It is normal for parents and teachers to hesitate in using social media and digital devices like smart phones due to the possible negative impacts. Teachers worry about digital divides, though they are split about the impact of digital tools on their students. Teachers see disparities in access to digital tools having at least some impact on their students. More than half (54%) say all or almost all of their students have sufficient access to digital tools at school, but only a fifth of these teachers (18%) say all or almost all of their students have access to the digital tools they need at home. (Pew Research Center, 2012).

3. Problem

A teacher might ask why is social media and Web 2.0 important to me as a science teacher? Then he just needs to think about how it is important to his students. Since most of them adapt to it very readily, and like to interact with their friends this way, many teachers are seeing a great deal of success by using these means of communicating with their students. Hemmi, Bayne and Land (2009) maintain that since students already collaborate, search for information, communicate and socialize using web technologies as part of their everyday lives there is no reason not to use the same skills and behaviors in the classroom to support learning.

How these technologies are used and how it is integrated into the learning process in science is crucial. In this study, the researcher was trying to explore the use and the impact of social media technologies on teaching and learning science in Saudi.

4. Questions

The study was designed to address four questions which were central to the perception and expectations of our teachers and students in regard the use and the impact of social media:

1. How do our teachers comparing with our students currently use social media?
2. How do our teachers and our students see the impact of social media on education?
3. Do our science teachers believe that the official use of social media can enhance their teaching experience?
4. Do our students believe that the official use of social media can enhance their learning experience in science?

5. Population

Teachers and students who were targeted in the study are in public middle “intermediate” schools in the city of Riyadh, the capital of Saudi Arabia. The General Directorate of Education in Riyadh has 14 educational centres for boys’ schools “3 outside the city limit”, and 16 educational centres for girls’ schools “6 outside the city limit”, based on geographical regions in the city of Riyadh.

Due to the separation of schools by gender in Saudi and the possible need to direct contact with teachers and students, the study focused only on male schools.

6. Sample

6.1: About the schools in the survey:

The sample was stratified by conducting sampling to ensure that it would be as representative as possible in terms of geographical regions in the city of Riyadh. Using random sampling, the researcher picked two schools from each educational center inside the limits of the city of Riyadh “11 educational centers”. Each school has from 2 to 3 science teachers, and the teachers total been 63 science teachers.

6.2: About the teachers who participated in the survey:

The survey involved 63 science teachers from the targeted schools, 57 representing 90.48% accurate and precise responses were received. Teachers who participated in the survey teach science in middle “intermediate” public schools, from different parts of the city; thus the findings reported here reflect that environment almost exclusively. In addition, almost one-quarter of the teachers’ sample has received training in how to use ICT in teaching.

6:3: About the students who participated in the survey:

The survey involved 782 students in middle "intermediate" public schools, 664 representing 84.91% accurate and precise responses were received. The age average limits for middle "intermediate" schools in Saudi are between 12 and 15 years old.

7. Methodology

The study conducted on the first semester of the school year 1435/1436H (2014/2015), and the study implemented a closed-end questions questionnaire, with 46 statements. The same questionnaire was given to both students and teachers.

The questionnaires were constructed to solicit information about the current use of social media in teaching science and the views about it. It consisted of five categories to measure individual position in terms of the current use and view of usefulness of the social media as informal education tools, besides its effects on the student/teacher's learning experience.

Basic demographic questions regarding previous experiences and training in the use of ICT, possession of owning smart phones and similar devices, were also included.

The Arabic versions of the questionnaire were initially discussed individually with five teachers and five students for feedback and then reviewed by five researchers in the fields of science education, and ICT. According to the comments, corrections were made.

8. Results and Discussion

The teachers' and the students' respond to questionnaire 46 statements "Qs", presented in tables 1 to 5 as a comparison between teachers' views and students views.

The instrument is a 46-item Likert-scale questionnaire, the answers for statements from 1 to 23 were chosen from *Yes* or *No* positions. Statements 1 to 10 aimed to investigate the teachers' vs. the students' smart phones and computer access and competency profile, while statements 11 to 23 targeted teachers' vs. students' use of social websites.

For questionnaire statements 24 to 56, the answers were chosen from *a* indicating strong agreement, *b* indicating agreement, *c* indicating strong disagreement, or *d* indicating strong disagreement. The answers then were converted into numerical scores for calculating purposes with *a* being converted to 4, *b* to 3, *c* to 2, and *d* to1. Questionnaire statements 24 to 34 measure teachers' vs. students' current use of the web, while statements 35 to 41investigate teachers' vs. students' views of the impact of social websites; lastly, statements 42 to 46 aimed to determine teachers' vs. students' views of possible impact of official use of social media in teaching and learning.

8.1. Smart Phones and Computer Access and Competency Profile

Table 1. shows the basic demographic characteristics of the study sample. Questions 1 to 10 are based on previous experiences and training in the use of ICT, possession of owning smart phones and similar devices.

Table 1. Teachers vs. students smart phones and computer access and competency profile

Questions	Access and competency item	Teachers (*n*=57)		Students (*n*=664)	
		f	%	f	%
Q1	Has done a basic course in computer science, ICT, etc.	15	26.32	18	2.80
Q2	Owns smart mobile phone	57	100	482	72.95
Q3	Owns an iPad	9	15.79	267	41.46
Q4	Owns a tablet "other than iPad"	12	16.00	3	0.45
Q5	Owns an e-book reader	1	1.75	0	0.00
Q6	Owns a notebook "laptop"	39	68.42	52	8.07
Q7	Owns a desktop for personal use	27	47.39	58	9.01
Q8	Easy access to computers with Internet access at home	33	57.90	164	25.47

Q9	Have Internet plan in smart phone	48	84.21	86	13.35
Q10	Have Internet access at home	54	94.74	562	84.64

From Table 1., it is clear that the students don't have training in using computers or ICT, where 2.80% only had such training, comparing with 26.32% of the teachers; the result indicates that middle schools don't provide the students with any kind of training in using computers or smart phones either for educational purposes or in general use.

Q2 which read: Owns smart mobile phone, shows that all the teachers (100%) have smart phones vs. almost three quarters (72.95%) of the students. This is an excellent opportunity supporting the use of smart phones in education. Furthermore, 41.46% of the students owns an iPad (Q3), comparing with 15.79% of the teachers; in the meantime, 16.00% of the teachers owns a tablet "other than iPad" (Q4), which is very rare for the students, with only 0.45%. Using e-book reader (Q5) has the lowest percentage ever, 0.00% for the students vs. 1.75% for the teachers.

For the teachers, the second highest percentage after smart phones, owns a notebook "laptop" (Q6) with 68.42%, and then owning a desktop for personal use (Q7) with 47.39%; unfortunately, only 8.07% of the students own a notebook, and 9.01% own a desktop for personal use. At the best, 25.47% of the students have easy access to shared computers with Internet access at home (Q8), comparing with 57.90% of the teachers; which make them less likely to be used by the students in education.

Regarding the access to the Internet, luckily, 84.64% of the students have Internet access at home (Q10), vs. 94.74% of the teachers, although only 13.35% of the students have Internet plan in smart phone (Q9) comparing with 84.21% of the teacher. So, the massive majority of the teachers and the students have easy access to the Internet all the time.

8.2. Teachers and Students Use of Social Websites

The study first question, which read: *How do our teachers comparing with our students currently use social media,* was answered by responds to statements presented in Table 2. and Table 3.

Table 2. Teachers vs. students use of social websites

Questions	The use of social websites item	Teachers (*n*=57)		Students (*n*=664)	
		f	%	f	%
Q11	Is registered in a social network site "educational forum"	37	64.91	93	14.44
Q12	Is registered in Facebook	8	14.06	2	0.31
Q13	Is registered in Twitter	28	49.12	106	15.96
Q14	Is registered in Instagram	35	61.40	461	69.43
Q15	Is registered in WhatsApp	57	100	481	72.44
Q16	Is registered in Telegram	12	21.05	5	0.75
Q17	Is registered in Keek	6	10.53	297	44.73
Q18	Is registered in Snapchat	4	7.02	348	52.41
Q19	Is registered in Skype	3	5.26	68	10.24
Q20	Is registered in Path	2	3.51	195	29.37
Q21	Is registered in Tango	1	1.75	38	5.72
Q22	Published anything on YouTube	4	7.2	2	0.31
Q23	Have an active e-mail "Use e-mail frequently, ex. once a week"	42	73.68	4	0.60

Q11 in Table 2. shows that the familiarity with social network sites "educational forum" is high for the teachers, where 64.91% of them registered at least at an educational forum, comparing with 14.44 % of the students, which might be high for middle school students. On the contrary, having an active e-mail "Use e-mail frequently, ex. once a week" (Q23) has the second lowest percentage for the students, with only 0.60%, comparing with 73.68% for the teachers, which is form the researcher point of view, lower than expected. For Q22, regarding publishing anything on YouTube, 7.2% of the teachers answered yes, comparing with only 0.31% of the students (2 out of 644), although it is low percentage, but it is expected from middle school students.

The ranking of the use of social media applications (Q 12 to 21) for the students from the highest to the lowest as follow: WhatsApp 72.44%, Instagram 69.43%, Snapchat 52.41%, Keek 44.73%, Path 29.37%, Twitter 15.96%, Skype 10.24%, Tango 5.72%, Telegram 0.75%, Facebook 0.31%.

Comparing with the ranking of the use of social media applications for the teachers from the highest to the lowest as follow: WhatsApp 100%, Instagram 61.40%, Twitter 49.12%, Telegram 21.05%, Facebook 14.06%, Keek 10.53%, Snapchat 7.02%, Skype 5.26%, Path 3.51%, Tango 1.75%.

It is clear that the teachers and the students use WhatsApp, 100% and 72.44% respectively, as a main social media application in their contact with others, and then the second one is Instagram with 69.43% of the students and 61.40% for the teachers, as a visual interaction. Other than the tow applications, there are differences between the teachers and the students in regards the popularity of other social media applications. The third popular application for the teachers is Twitter used by 49.12% of them, but for the students it is the sixth application with only 15.96%. The Telegram application, which is similar to WhatsApp, but has the possibility, to add more members in the group and accept sending documents, besides allowing sending large file size has 21.05% of the teachers' use, which make in the fifth place for their uses, comparing with only 0.75% for the students, which make it in the second lowest use after Facebook (0.31%) that has the fifth place for the teachers with 14.06%.

The rest of social media applications uses have significant differences between the teachers and the students, which make it difficult to adopt any of them for educational purposes. Students tend to use new social media applications that allow quick chatting and showing temporarily shots and photos. For example, Snapchat is used by 52.41% of the students, which make it in the third place for them, while it is in the seventh place for the teachers with only 7.02% of their use of social media applications.

Unexpectedly, the students use Skype more than the teachers with almost the double difference, where the students have 10.24% vs. the teachers with only Skype 5.26%, probably due to the free way to chat with their friends without blames form parents for the high cost of using phone and mobile calls. Finally, Tango is has low interest of use for both the teachers and the students, with 5.72%, and 1.75% respectively.

8.3. Teachers and Students Current Use of the Web

Table 3. statements are related to the study first question as well, which concern the current use of social media by the teachers comparing with the students.

Table 3. Teachers vs. students current use of the web

Questions	The Current Use of the Web Items	Mean Differences (Ss-Ts)	Teachers' Mean* (*n*=57)	Students' Mean* (*n*=664)
Q24	Plays games on the internet frequently "more than once a week"	2.11	1.14	3.25
Q25	Ever looked up a science or health information on the internet	-1.97	3.39	1.42
Q26	Is familiar with public social network sites "educational forums, Facebook, Twitter, etc."	-0.43	3.16	2.73
Q27	Is familiar with Blogs and Wikis.	-1.46	2.73	1.27
Q28	Surfed YouTube frequently "more than once a week"	-0.03	2.55	2.52
Q29	Willing to use the Internet to buy something	-2.19	3.22	1.03
Q30	Use Google and Google Scholar regularly for studies	-1.50	3.11	1.61
Q31	Surfed the official websites related to my science textbooks, like: Ministry of Education, Educational Centres, Science & Math Project, etc.	-1.19	2.36	1.17
Q32	Contact or personal experience with educational services providers, including consolations	-1.62	2.64	1.02
Q33	Social media has had such an impact on enabling my interaction with students and teachers in issues not related to study.	-0.75	3.78	3.03
Q34	I use my smart phone "or other portable devices" with my students/teacher to complete assignments.	-0.25	1.32	1.07

* Strongly disagree=1; disagree=2; agree=3; strongly agree=4.

Overall, the teachers had higher mean scores on the different questions comparing with the students. The only question that had higher mean for the students is Q24 (Plays games on the internet frequently "more than once a week"), where the students mean 3.25 out of 4 comparing with 1.14 for the teachers.

The second lower mean for the teachers was for Q34 "I use my smart phone "or other portable devices" with my students/teacher to complete assignments" with a mean of 1.32 only, in the mean time, this question had also the second lower mean for the students with a mean of 1.07 only, which shows a strong disagreements on using their portable devices for completing assignments purposes.

Except Q24, and Q34 the teachers means show a positions of agreement or strong agreement, with a range of 3.78 for the highest mean, related to Q33 that read "Social media has had such an impact on enabling my interaction with students and teachers in issues not related to study", and the lowest agreement was for Q31 (Surfed the official websites related to my science textbooks, like: Ministry of Education, Educational Centres, Science & Math Project, etc.) with a mean of 2.36.

For the students their means shows positions of strong disagreements and disagreements in all the eleven questions except four questions, which is Q24 "Plays games on the internet frequently "more than once a week"" with a mean of 3.25, Q33 (Social media has had such an impact on enabling my interaction with students and teachers in issues not related to study) with 3.03, Q26 (Is familiar with public social network sites "educational forums, Facebook, Twitter, etc.") with 2.73, and Q28 (Surfed YouTube frequently "more than once a week") with a mean of 2.52.

The rest of the students' means shows a shift to strong disagreements ranging from the lowest of 1.07 for Q32 (Contact or personal experience with educational services providers, including consolations), and a mean of 1.61 for Q31 (Use Google and Google Scholar regularly for studies), which make it closer to disagreements.

The closest means for the teachers and the students was for Q28 (Surfed YouTube frequently "more than once a week") with a mean of 2.55 for the teachers comparing with 2.52 for the students, with only -0.03 mean differences, while the highest mean differences was for Q29 (Willing to use the Internet to buy something) with -2.19, which is expected.

8.4. Teachers and Students Views of the Impact of Social Media on Education

Table 4. statements are related to the study second question, which read as: *How our teachers and our students see the impact of social media on education?*

The entire means for the teachers and the students shows positions of agreements and strong agreements, which means that the teachers and the students see a positive impact of social media on education.

Table 4. Teachers vs. students views of the impact of social media on education

Questions	The Impact of Social Websites Items	Mean Differences (Ss-Ts)	Teachers' Mean* (*n*=57)	Students' Mean* (*n*=664)
Q35	Increasing student motivation and engagement with course material	-0.69	3.36	2.67
Q36	Increasing student-to-student collaboration	0.78	2.13	2.91
Q37	Enhanced interaction between the student and the teacher	1.68	2.21	3.89
Q38	Accelerated data and information sharing	0.34	2.55	2.89
Q39	Removes barriers to self-expression and contribution	0.41	2.85	3.26
Q40	Provides students with 21st Century skills which could aide their employability and increase levels of satisfaction	-0.51	3.29	2.78
Q41	Increasing the possibilities of adapting inappropriate social behaviours	-1.39	3.64	2.25

* Strongly disagree=1; disagree=2; agree=3; strongly agree=4.

Means differences between the teachers' and the students' responds are low in general, except for two questions. Q37 (Enhanced interaction between the student and the teacher) had strong agreements by the students, with a mean of 3.89, while the teachers' mean was 2.21, which gives an agreement position, the mean differences was 1.68. The second question was Q41 (Increasing the possibilities of adapting inappropriate social behaviours), with opposite situation, where the students mean was 2.25, while the teachers mean was 3.64, with a mean differences of -1.39. This question has a special importance in education, where some educators are concern about increasing the possibilities of adapting inappropriate social behaviours when using social media widely by students.

The results of Q41 show that the teachers are more concerned about the possibilities of adapting inappropriate social behaviours by the students. The teachers mean represents almost strong agreements; while the students are less concerned, with a position closer to agreement.

The lowest mean differences between the teachers and the students was for Q38 (Accelerated data and information sharing), where the teachers mean was 2.55, and the students mean was 2.89, with only 0.34 mean difference.

8.5. Teachers and Students Views of Possible Impact of Official Use of Social Media on Teaching and Learning

The third study question *(Do our science teachers believe that the official use of social media can enhance their teaching experience?)*, and the fourth study question *(Do our students believe that the official use of social media can enhance their learning experience in science?)* were addressed by statements from 42 to 46. The results are represented in Table 5.

Table 5. Teachers vs. students views of possible impact of official use of social media on teaching and learning

Questions	The impact of official use of social media on teaching and learning items	Mean differences (Ss-Ts)	Teachers' Mean* (*n*=57)	Students' Mean* (*n*=664)
Q42	If used officially "formal use by the MOE", social media could have a major impact on my ability to access content, resources, and materials for my science class.	-0.48	3.27	2.79
Q43	If used officially, social media could have a major impact on my ability to share ideas with my class "teachers and students".	-0.08	3.84	3.76
Q44	If used officially, social media could have a major impact on educational partners "school and home" abilities to interact with each other.	-0.29	3.23	2.94
Q45	If used officially, I believe that the MOE will not cover the cost of devices and Internet cost.	0.04	3.96	3.92
Q46	If used officially, social media could have a major impact on parents, where they may not be able to cover the cost of devices and Internet cost.	0.53	3.26	3.79

* Strongly disagree=1; disagree=2; agree=3; strongly agree=4.

Table 5. shows the teachers' and the students' views of possible impact of official use of social media in teaching and learning. The teachers' means for all questions are greater than the means of the students for each question, except for Q46. All the teachers' means are above 3, which represents higher than agreement positions. The highest mean for the teachers was for Q45 (If used officially, I believe that the MOE will not cover the cost of devices and Internet cost.), which indicates that almost all the teachers believe that the Ministry of Education (MOE) will not be supporting the students with appropriate devices or covering the Internet plans costs. The teachers' mean of 3.96 for Q45 shows that the teachers are confident of covering the costs by home. The students mean for the same question was 3.92, which also represents the same believe but with a slit lower difference of -0.04. Related to covering the cost of the official use of social media in education, the statement (If used officially, social media could have a major impact on parents, where they may not be able to cover the cost of devices and Internet cost) in Q46 showed a concern form the teachers and the students, where the students mean of 3.79 vs. the teachers mean of 3.26, with only 0.53 mean difference, raise the apprehension that if the MOE didn't cover the cost of using social media officially, parents wouldn't be able to cover the cost, therefore the project will collapse.

Q43 (If used officially, social media could have a major impact on my ability to share ideas with my class "teachers and students") represents the second closest mean between the teachers and the students, with only -0.08 mean differences, which represents agreements between the teachers and the students. Both means were high, with 3.84 for the teachers, and 3.76 for the students.

The lowest mean for the students was for Q42 (If used officially "formal use by the MOE", social media could have a major impact on my ability to access content, resources, and materials for my science class), which was 2.79, comparing with 3.27 for the teachers, with -0.48 mean differences.

Moreover, regarding the relationship between school and home, represented in Q44 (If used officially, social media could have a major impact on educational partners "school and home" abilities to interact with each other),

the teachers' mean of 3.23, are little higher than the students' mean of 2.94, with -0.29 mean difference, which doesn't affect the agreements between the teachers and the students.

9. Conclusion and further implications:

From the basic characteristics of Saudi middle school teachers and students, and from the answers of study question number one, it is apparently that smart phones are the best possible device to enhance the use of social media in education, where all teachers and almost three quarters of students have smart phones. For the Internet access, almost 85% of the students have Internet access at home vs. 95% of the teachers. In regards the social media applications, it is clear that teachers and students use WhatsApp as a main tool, with 100% for the teachers, and almost 73% for the students.

On the controversy, from the answers of study question number four, both the teachers and the students have deep concerns of possible high costs of adopting the use of social media officially by the MOE. If we put this result with the agreements that the current use of social media in middle school now are rare, we can come to a conclusion that our teachers and our students are not using the smart phones in an appropriate way.

Furthermore, from the answers of study question number two, three and four, both the teachers and the students are willing to use social media in teaching and learning, and they believe that such use will enhance their experiences in teaching and learning, but the practice is significantly low.

The infrastructure is available and handy with all the teachers and with the massive majority of the students, but the comprehension educational view is absent for both of them. This conclusion is supported by the fact that both the teachers and the students agree that they use social media for interaction with others, including other students and teachers, but for purposes other than education.

The researcher suggest that the both the teachers and the students need a series of training sessions to evaluate their own use of social media, and to enhance their abilities to use available properties. This is the first step before thinking of implementing the use of social media officially.

Acknowledgement

The study was supported by a grant from Educational Research Center, College of Education, King Saud University, Riyadh, Saudi Arabia.

References

Barab, S., and Duffy, T. (2000) From Practice Fields to Communities of Practice. *Theoretical Foundations of Learning Environments. (1)* (pp 25–55).

Battrawi, B., and Muhtaseb, R. (2010) *The Use of Social Networks as a Tool to Increase in Science and Science Literacy: A Case Study of Creative Minds' Facebook Page*. *International Conference on New Perspectives in Science Education*.

Brindley, J., Walti, C., and Blaschke, L. (2009) Creating Effective Collaborative Learning Groups In An Online Environment. *The International Review of Research in Open and Distance Learning*, 10(*3*). Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/675/1271

Casey, G., and Evans, T. (2011) Designing for Learning: Online Social Networks as a Classroom Environment. *The International Review of Research in Open and Distance Learning*, 12(*7*), (pp 1-26).

Crane, V., Nicholson, H., Chen, M., and Bitgood, S. (1994) *Informal Science Learning,' in What the Research Says About Television, Science Museums, and Community-Based Projects*, Epharata, Pennsylvania, Science Press.

Dawson, S. (2006) A Study of the Relationship between Student Communication Interaction and Sense of Community. *The Internet and Higher Education*. 9 *(3)*. (pp 153–62).

Day, K., and Wells, S. (2009) Adapting Social Media as a Scaffolding Tool for Teaching Health Informatics. In *Same places, different spaces. Proceedings ascilite,* Auckland. http://www.ascilite.org.au/conferences/auckland09/procs/day.pdf (last accessed on 02/08/2014)

DeSchryver, M., Mishra, P., Koehler, M., and Francis, A. (2009) Moodle vs. Facebook: Does Using Facebook for Discussions in an Online Course Enhance Perceived Social Presence and Student Interaction? In *Proceedings of Society for Information Technology and Teacher Education International Conference*, Chesapeake, VA, (pp 329–336).

Dihoff, R., Brosvic, G., and Epstein, M. (2003) The Role of Feedback during Academic Testing: The Delay Retention Effect Revisited. *Psychological Record.* 53 *(4)*. (pp 533–48).

Dihoff, R., Brosvic, G., and Epstein, M. (2004) Provision of Feedback during Preparation for Academic Testing: Learning Is Enhanced by Immediate but not Delayed Feedback. *Psychological Record.* 54 (2) (pp 207–232).

Dubner, S., and Levitt, S. (2006) Freakonomics: A Star Is Made. *New York Times Magazine*, May 7.

Dunn, L. (2013) *Student Centred Learning*. University of Glasgow. http://www.gla.ac.uk/otherdepts/TLS/ Project/Reports (last accessed 07/10/2014).

Ellis, A. (2001) *Student-Centered Collaborative Learning Via Face-To-Face And Asynchronous Online Communication: What's The Difference*? In Proceedings of the 18th Annual Conference of the Australian Society for Computers in Learning in Tertiary Education, Melbourne, Australia. (pp. 169-177).

Finegold, A., and Cooke, L. (2006) Exploring the Attitudes, Experiences and Dynamics of Interaction in On-Line Groups. *The Internet and Higher Education*, 9 (*3*), (pp 201-215).

Fusch, D. (2011) Social Media and Student Learning: Moving the needle on engagement in *Academic Impressions*, pp. 15. In Dunn, L. (2013) *Student Centred Learning*. University of Glasgow. http://www.gla.ac.uk/otherdepts/TLS/ Project/Reports (last accessed 07/10/2014).

Graff, M. (2003) Individual Differences in Sense of Classroom Community in a Blended Learning Environment. *Journal of Educational Media.* 28 *(2–3)*: (pp 203–210).

Greenhow, C., and Gleason B. (2012) Twitteracy: Tweeting as a New Literacy Practice. *The Educational Forum*, (*76*). (pp, 463-477).

Hahn, J. (2008) Born Digital: Understanding the First Generation of Digital Natives. *Library Journal*, 133(*13*), 105.

Halverson, R, and Smith, A. (2009) How New Technologies Have (and Have Not) Changed Teaching and Learning in Schools. *Journal of Computing in Teacher Education*. Volume 26 (*2*), (pp 49-54)

Hattie, J., and Timperley, H. (2007) The Power of Feedback. *Review of Educational Research.* 77 *(1)* (p 81).

Hemmi, A., Bayne, S., and Land, R. (2009) The Appropriation and Repurposing of Social Technologies in Higher Education. *Journal of Computer Assisted Learning*, 25(*1*), 19-30.

Hodder, R., Rivington, R., Calcutt, L., and Hart, I. (1989) The Effectiveness of Immediate Feedback during the Objective Structured Clinical Examination. *Medical Education* 23 *(2)*. (pp 184–188).

Jovanovic, J., Chiong, R., and Weise, T. (2012) Social Networking, Teaching, and Learning. *Interdisciplinary Journal of Information, Knowledge, and Management*. Volume (*7*), (pp.39-43)

Junco, R., Heiberger, G., and Loken, E. (2011) The effect of Twitter on college student engagement and grades. *Journal of Computer Assisted Learning, 27*(2), (pp 119-132). doi:10.1111/j.1365-2729.2010.00387.x

Kaplan, A., Haenlein, M., and Mason, R. (2008) *E-learning and social networking handbook: Resources for higher education*. New York: Routledege. In Ralph, M; and Ralph, L. (2013) Weapons of Mass Instruction: The Creative use of Social Media in Improving Pedagogy. *Issues in Informing Science and Information Technology*. Volume (*10*) (pp 449-460).

King, G., and Sen, M. (2013) The Teacher: How Social Science Research Can Improve Teaching American Political Science Association, *PS: Political Science and Politics* 46, no. (3) (pp 621-629)

Klopfer, E., Osterweil, S., Groff, J., and Haas, J. (2009) *The Instructional Power of digital games, Social Networking, Simulations and How Teachers Can Leverage Them*. The Education Arcade: Massachusetts Institute of Technology.

Mason, R. (2008). *E-learning and social networking handbook: Resources for higher education*. New York: Routledege.

National School Board Association (2007) CREATING & CONNECTING // Research and Guidelines on Online Social-and Educational-Networking. Available online at: http://www.nsba.org/creating-connecting-research-and-guidelines-online-social-%E2%80%94-and-educational-%E2%80%94-networking#sthash.exzPqdtu.dpuf.

Pew Internet and American Life Project (2010). Social media and Mobile Internet use among teens and young adults. Retrieved from http://www.pewinternet.org/Reports/2010/Social-Media-and-Young-Adults.aspx

PewResearchCenter (2012) How Teachers Are Using Technology at Home and in Their Classrooms, Pew Research Center's Internet & American Life Project. (Ed. Kristen Purcell, Alan Heaps, Judy Buchanan, Linda Friedrich); Washington, D.C. Retrieved from http://pewinternet.org/Reports/2013/Teachers-and-technology

Prensky, M. (2001) Digital Natives, Digital Immigrants. *On the Horizon*, 9 (*5*), (pp 1-6). In Jovanovic, J., Chiong, R., and Weise, T. (2012) Social Networking, Teaching, and Learning. *Interdisciplinary Journal of Information, Knowledge, and Management*. Volume (*7*), (pp.39-43)

Ralph, M, and Ralph, L. (2013) Weapons of Mass Instruction: The Creative use of Social Media in Improving Pedagogy. *Issues in Informing Science and Information Technology*. Volume (*10*) (pp 449-460).

Rovai, A. (2003) The Relationships of Communicator Style, Personality-Based Learning Style, and Classroom Community among Online Graduate Students. *The Internet and Higher Education.* 6 *(4)*. (pp 347–63).

Shea, P. (2006) A Study of Students' Sense of Learning Community in Online Environments. *Journal of Asynchronous Learning Networks.* 10 (1). (pp 35–44).

The Center for the Advancement of Informal Science Education (CAISE) website. (2014) http://informalscience.org/ (last accessed on 26/08/2014)

Wetzel, D. (2010) *Elearning Replaces the Traditional Model of Teaching and Learning*. Retrieved from: http://suite101.com/article/elearning-replaces-the-traditional-model-of-teaching-and-learninga227736 (last accessed on 15/10/2014)

Wilson, C., Grizzle, A., Tuazon, R.; Akyempong, K., and Cheung, C. (2011) *Media and Information Literacy Curriculum for Teachers* (Ed. Alton Grizzle and Carolyn Wilson) the United Nations Educational, Scientific and Cultural Organization. Paris: France.

Zepke, N., and Leach, L. (2010) Improving student engagement: Ten proposals for action. *Active Learning in Higher Education.* 11. (pp 167-177).